Claims

1. An electrooptical liquid crystal switching element, comprising a liquid crystal layer (2) and a reorientation means (7, 11) for reorienting the liquid crystal layer (2) to current orientation in which the electrooptical liquid crystal switching element (1, 18, 28) has a different light transmission, the reorientation means comprising a field-generating structure (7) for generating an electric field effecting reorientation and the electric field of the field-generating structure (7) having a field component oriented predominantly in parallel with the liquid crystal layer (2), characterized in that

(a) the liquid crystal (2) has a twistable structure and the amount of light transmission through the liquid crystal (2) depends on its degree of twist;

(b) the liquid crystal (2) is anchored in an alignment in the initial state in which it is in the untwisted or twisted state and its axis of twist remains perpendicularly or substantially perpendicularly to the liquid crystal layer (2); and

(c) the field component of the reorientation means (7, 11) oriented predominantly in parallel with the liquid crystal layer (2) can be varied in such a way that, for adjusting various degrees of light transmission, the degree of twist of the liquid crystal (2) is thereby changed.

2. The electrooptical liquid crystal switching element according to claim 1, characterized in that the field component of the reorientation means (7, 11) oriented predominantly in parallel with the liquid layer (2) can be changed in such a way that the degree of twist of the liquid crystal (2) is changed continuously or stepwise for the continuous or stepwise adjustment of different degrees of

light transmission in the range between substantially maximum and minimum light transmission.

3. The electrooptical liquid crystal switching element according to claim 1 ~~or 2~~, characterized in that the field component oriented predominantly in parallel with the liquid crystal layer (2) forms an angle of orientation (β_o), which is greater than 0° and less than 90°, with the preferred direction which the liquid crystal layer (2) has on its layer side facing the field-generating structure (7) in its alignment in the initial state.

4. The electrooptical liquid crystal switching element according to claim 3, characterized in that the angle of orientation (β_o) is greater than 70° and less than 90° in the case of positive dielectric anisotropy ($\Delta\varepsilon$) of the liquid crystal (2).

5. The electrooptical liquid crystal switching element according to claim 3, characterized in that the liquid crystal (2) has a negative dielectric anisotropy ($\Delta\varepsilon$), the angle of orientation (β_o) being less than 20° and greater than 0°.

6. The electrooptical liquid crystal switching element according to any one of claims 1 ~~to 5~~, characterized in that, at least on its layer side facing the field-generating structure (7), the alignment in the initial state of the liquid crystal layer (2) includes a pretilt angle (α_o), which is greater than 0° and less than 30°, together with a plane in parallel with the liquid crystal layer (2).

7. The electrooptical liquid crystal switching element according to any one of claims 1 ~~to 6~~, characterized in that the field-generating structure (7) comprises strip or line-type electrodes (9, 10) which extend in parallel with one another and in parallel with the liquid crystal layer (2) and are alternately applied with a differing electric potential.

8. The electrooptical liquid crystal switching element according to claim 7, characterized in that the strip or line-type electrodes (9, 10) are arranged alternately in at least two planes in parallel with the liquid crystal layer (2).

9. The electrooptical liquid crystal switching element according to claim 7 ~~or 8~~, characterized in that the strip or line-type electrodes (9, 10) to which a differing potential is applied are arranged in comb-like engagement in the same plane.

10. The electrooptical liquid crystal switching element according to any one of claims 1 ~~to 9~~, characterized in that a polarizer (15) is provided on one side of the liquid crystal layer (2) and an analyzer (16) is provided on the other side thereof to operate the electrooptical liquid crystal switching element (1) in the direct-light mode.

11. The electrooptical liquid crystal switching element according to any one of claims 1 ~~to 9~~, characterized in that a polarizer/analyzer (22) is provided on one side of the liquid crystal layer (2) and a reflector (8a, 19) is provided on the other side thereof to operate the electrooptical liquid crystal switching element (18, 28) in the reflection mode.

12. The electrooptical liquid crystal switching element according to claim 11, characterized in that the reflector (8a, 19) is a dielectric mirror.

13. The electrooptical liquid crystal switching element according to claim 12, characterized in that the dielectric mirror (8a) is arranged between the liquid crystal (2) and one substrate (3).

14. The electrooptical liquid crystal switching element

according to any one of claims 10 ~~to 13~~, characterized in that a birefringent optical compensator (17) is provided between liquid crystal layer (2), on the one hand, and polarizer (15) and/or analyzer (16) or polarizer/analyzer (22), on the other hand.

15. The electrooptical liquid crystal switching element according to any one of claims 1 ~~to 14~~, characterized in that the liquid crystal layer (2) contains a dichroic dye and a polarizer (15) is provided on at least one side thereof.

16. Use of the electrooptical liquid crystal switching element according to any one of claims 1 ~~to 15~~ for varying the brightness and/or color of an image spot of an electrooptical display means.

17. Use according to claim 16, characterized in that the electrooptical display means is a display screen.

18. Use according to claim 16 ~~or 17~~, characterized in that the optical liquid crystal switching elements (1, 18, 28) of the display means are driven by a transistor matrix.

19. Use according to claim 16 ~~or 17~~, characterized in that the optical liquid crystal switching elements (1, 18, 28) of the display means are driven by a direct driving means according to the time multiplex method.

Add B2

Add E5